***Lesson Plan Template for NS4***

Adapted from: Smith, Margaret Schwan, Victoria Bill, and Elizabeth K. Hughes. “Thinking Through a Lesson Protocol: Successfully Implementi ng High-Level Tasks.”

*Mathematics Teaching in the Middle School 14* (October 2008): 132-138.

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| **PART 1: SELECTING AND SETTING UP A MATHEMATICAL TASK** | |
| What are your mathematical goals for the lesson? (i.e., what do you want  students to know and understand about mathematics as a result of this lesson?) | Understand that a factor is a whole number that divides without a remainder into another number.  How to find the greatest common factor that is shared by two whole numbers less than 100. |
| What are your expectations for students as they work on and complete this task?   What resources or tools will students have to use in their  work that will give them entry into, and help them reason through, the task?   How will the students work—  independently, in small groups, or in pairs—to explore this task?   * How will students record and report their work? | The task will be written on the board for student reference  Students will work in pairs to solve the task.  Materials needed: pencil, paper, math journal  Recorded in math journal. |
| How will you introduce students to the activity so as to provide access to *all*  students while maintaining the cognitive demands of the task? | What do the two numbers have in common? (even or odd, factors, same number of digits, etc.)  Explain the vocabulary of Greatest Common Factor:   * Greatest * Common * Factor   Explain what a GCF is. |

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| **PART 2: SUPPORTING STUDENTS’ EXPLORATION OF THE TASK** | |
| As students work independently or in small groups, what questions will you ask to—   help a group get started or make progress on the task?   focus students’ thinking on the  key mathematical ideas in the task?   assess students’ understanding of  key mathematical ideas, problem- solving strategies, or the representations?   advance students’ understanding  of the mathematical ideas? | 1. How many sixth graders? 2. How many seventh graders? 3. How many could there be in each group? 4. How do you know? 5. What are the factor pairs for sixth graders? 6. What are the factor pairs for seventh graders? 7. How do you know? |
| How will you ensure that students remain engaged in the task?   What assistance will you give or what questions will you ask a  student (or group) who becomes  quickly frustrated and requests more direction and guidance is  solving the task?   What will you do if a student (or group) finishes the task almost  immediately? How will you  extend the task so as to provide additional challenge? | * Tell students that they will have the opportunity to share their work with the class. * Address any questions they may have. * Review factoring. * Make sure they understand factor pairs. * Give a written explanation of how you solved the task. * Write a task of your own to solve. * Have them try to find the GCF of three whole numbers. * Find two different numbers that have the same GCF as 16 and 20. * If you have a GCF that is 12 and one of the whole numbers is 60, what other whole numbers might be used to find the GCF? * Can you find another way to find the GCF? |

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| **PART 3: SHARING AND DISCUSSING THE TASK** | |
| How will you orchestrate the class discussion so that you accomplish your mathematical goals?   Which solution paths do you want to have shared during the  class discussion? In what order will the solutions be presented? Why?   What specific questions will you ask so that students will—  1. make sense of the  mathematical ideas that you want them to learn?  2. expand on, debate, and question the solutions being shared?  3. make connections among the different strategies that are presented?  4. look for patterns?  5. begin to form generalizations?  What will you see or hear that lets you know that *all* students in the class  understand the mathematical ideas that  you intended for them to learn? | * Have each pair compare their result with at least one other pair. * Discuss when you can use this skill. * Choose a few pairs who had different ways to solve the task to present their results and justify how they got there. |

Task for NS4:

Find the Greatest Common Factor of two whole numbers less than or equal to 100.

There are 16 sixth graders and 20 seventh graders in the rocket club. Students will be arranged in equal groups to build models, but each group will have only sixth or seventh graders. What is the greatest number of students than can be in each group?